HYDRO REGULATOR MODEL DEVELOPMENT 9704400

SHORT DESCRIPTION:
Develop PC based computer model capable of modeling dam operations in the Columbia and snake Rivers allowing the operator to perform independent analysis of various flow and storage criteria and plot comparitive studies.

SPONSOR/CONTRACTOR: CRITFC
Columbia River Inter Tribal Fish Commission
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SUB-CONTRACTORS:
Tom Cross

GOALS

GENERAL:
Supports a healthy Columbia basin, Adaptive management (research or M&E), Program coordination or planning, Basinwide, Education

ANADROMOUS FISH:
Hydro ops, mainstem passage, construction, Research, M&E

RESIDENT FISH:
Research, M&E

NPPC PROGRAM MEASURE:
5.1A; 5.4D; 5.4E

BACKGROUND

Project is an office site only

PURPOSE AND METHODS

SPECIFIC MEASUREABLE OBJECTIVES:
To model system operations accurately and independently to determine the best use of water leading toward restoration of anadromous fish in the Columbia and snake systems. This includes modeling the Tribal Recovery Plan and comparing with other system operation plans.

CRITICAL UNCERTAINTIES:
Critical to this project are the regional development partners. Changes in their development requirements, workload, staffing or budgets could affect the anticipated project outcome by delaying the reaching of consensus on development issues. There are no identifiable biological or environmental risks inherent in this project.

BIOLOGICAL NEED:
Model operation will lead to restoration of stocks as needed to honor tribal treaty fishing rights.

HYPOTHESIS TO BE TESTED:
System operations can be modified to meet the water needs of the anadromous fish.

ALTERNATIVE APPROACHES:
N/A

JUSTIFICATION FOR PLANNING:

The ability to model flows and simulate hydro operations is vital to resolving conflicting uses of the Columbia River. Effort must be put forth to develop tools capable of fine-tuning the systems operation in order to reach compromise on the competing use of a limited resource.

METHODS:

Currently, Hydro Regulator model consists of two parts - the interl model written in Fortran and the library or comparative study manager written in CA-Realizer using the Windows interface. Development has been done on two Pentium class personal computers - one for code development the other for verification and confidence testing. This project will apply structured application development techniques and manage the development process including documentation and distribution. Development priorities will be determined by the project Development Partners anticipated to be (but not limited to) BPA, NMFS, BOR, CRITFC, NPPC, CBFWA, OR/WA F&W.Prior to final release of the Hydro Regulator, model operations will be thoroughly tested and debugged. Model documentation will be written and distributed in accordance with established software standards.

PLANNED ACTIVITIES

SCHEDULE:

Planning Phase **Start** ASAP **End** Unknown **Subcontractor** NO

Task Complete contract negotiations with BPA for release of funds

Implementation Phase **Start** Unknown **End** Unknown **Subcontractor** YES

Task 1996-1997

Establish regional development partners and conduct worksessions
Complete analysis and testing of model variables and project parametersIncrease internal operating environment of model (extended memory)
Complete incorporatation of 60 water year depletion levels (1988 depletion levels)
Peer review of model
Develop software release packageRelease version 1.1 of Hydro RegulatorConduct user training as needed
Begin evaluation of incorporating other models (HydroSim, etc.)1997-1998
Decrease time steps from monthly to weeklyIncorporate simulated time-delay in water routing in a weely modeling mode.
Work with Development Partners in developing 60-water year weekly streamflow data that will work in a weely modeling mode with routing time-delay.
Develop input data manipulation tools (flood control curves, FELCC, etc)
Develop modeling capability to start in any period (e.g., January) and, using current period conditions, assess FCRPS future periods performance.
Continue peer review of model including comparision with other existing models.
Develop clickable, graphical representation of hydro system
Refine data boundary checking and error trapping
Expand interactive graphics
Develop interactive reports and spreadsheet input files generator
Begin integration with other models (HyrdoSim, etc.)
Begin development of probabilistic water year conditions
Begin incorporating simulation of operations of Upper Snake reservoirs
Release version 2.0
Update user documentation and Windows Help file
Conduct user training as needed.
1999-2000
Develop and incorporate economic analysis model
Continue integration with other models
Continue incorporatin of expanded Snake River operations
Release version 3.0
Conduct user training as needed.

O&M Phase **Start** Unk **End** Unknown **Subcontractor** YES

Task Conduct user training as needed
Revise and distribute model documentation
Release of software upgrades

PROJECT COMPLETION DATE:
2000

CONSTRAINTS OR FACTORS THAT MAY CAUSE SCHEDULE OR BUDGET CHANGES:
N/A

OUTCOMES, MONITORING AND EVALUATION

SUMMARY OF EXPECTED OUTCOMES

Expected performance of target population or quality change in land area affected:
Long range outcome will be the ability to model, and select from, various hydro operations scerios a combition of system operations that will lead to the restoration the fishery resource. The model will produce sufficient information for regional entities to truly coordinate and cooperate in the operation of the Columbia River hydro system to achieve optimal balanced usage of the resource.

Present utilization and convservation potential of target population or area:
N/A

Contribution toward long-term goal:
The Win HyReg model brings to the regional a common, easy-to-use, PC-based, hydrological model that will eble regional entities to independently hypothesize and compare various plant operation scerios leading to regional agreement on hydro operations.

Indirect biological or environmental changes:
None

Physical products:
Several small 3.5", 1.44MB floppy computer diskettes and documentation.

Environmental attributes affected by the project:
None

Changes assumed or expected for affected environmental attributes:
None

Measure of attribute changes:
N/A

Assessment of effects on project outcomes of critical uncertainty:
Documentation of delays in development program will be maintained and attached to any progress reports.

Information products:
HyReg model will produce graphical output (viewable and printable) that represents the selected output parameters (project, flow,

elevations, etc) as compared to another model run or biological opinion.

Coordination outcomes:
The HyReg model will bring together in a common are all regional entities competing for Columbia/Snake water resources. With so many competing demands on the resource, it is vital that the competitive element inherent in model operations be drastically reduced. By coorditing the development of this model throughout the region, it is anticipated that the final product will be acceptable as a common hydro simulation tool.

MONITORING APPROACH
This project has no direct biological or environmental outcomes. However, the successful implementation and use of this model will efect the operations of the hydro system to produce optimum conditions leading to restoration of the depleted salmon fisheries. Monitoring should encompass some independent evaluation of the use of the model at the regional policy level as stated in the NPPC Wildlife Program.

Provisions to monitor population status or habitat quality:
N/A

Data analysis and evaluation:
Peer review by Development Partners and selected regional hydro modelers (BPA, NMFS, NPPC, etc.)

Information feed back to management decisions:
Model will be operated by staff of fishery managers.

Critical uncertainties affecting project's outcomes:
The identifiable critical uncertainties revolve around issues that are not empirical in nature. Specifically, political correctness (depending on your point of view or position) can and does often effect projects of this nature. Establishing regional Development Partners early in the project is key to minimizing the impact of these critical uncertainties.

EVALUATION
Independent analysis of the models distribution and use. Project will be considered successful if, through the use of the HyReg model, regional entities reach consensus on a contested use of water.

Incorporating new information regarding uncertainties:
Through the Development Partners worksessions, project information will be dessiminated and new milestones set out.

Increasing public awareness of F&W activities:
It is anticipated that the impact of this model will justify efforts to make the public aware of the potential applications of the model in resolving regional issues.

RELATIONSHIPS

RELATED NON-BPA PROJECT	RELATIONSHIP
Win-HyReg/BoR	MOA

OPPORTUNITIES FOR COOPERATION:
This work is based, in part, on a Memorandum of Agreement between the Columbia River Inter-Tribal Fish Commission and the Bureau of Reclamation. Project nature requires ongoing regional cooperation (comparative analysis) in the development of the HyReg software.

COSTS AND FTE

1997 Planned: $92,000

FUTURE FUNDING NEEDS: **PAST OBLIGATIONS (incl. 1997 if done):**

FY	$ NEED	% PLAN	% IMPLEMENT	% O AND M
1998	$92,000	15%	75%	10%
1999	$92,000	5%	80%	15%

FY	OTHER FUNDING SOURCE	AMOUNT	IN-KIND VALUE
1998	BOR		$15,000

OTHER NON-FINANCIAL SUPPORTERS:
NPPC, CBFWA, John Fazio, Michael Newsome, Al Scholz, Tom Cooney, Phil Thor, Jim Fodrea (Reclamation), unnamed Development Partners

1997 OVERHEAD PERCENT: 38%

HOW DOES PERCENTAGE APPLY TO DIRECT COSTS:
Portion (CRITFC Project manager)

CONTRACTOR FTE: 1 - CRITFC Project manager (.15 FTE)

SUBCONTRACTOR FTE: 1 - Software Development manager (1 FTE)